Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A cross-correlation method for laser pulses, comprising:

(a) providing first and second repetitively pulsed laser resonators delivering first and second pulse trains at respectively first and second pulse repetition frequencies;

(b) directing said pulse trains to spatially overlap on a detector, said detector providing a response when a pulse of said first pulse train temporally overlaps a pulse of said second pulse train, said detector response having a magnitude dependent on the degree of temporal overlap of said pulses;

(c) varying the optical length of said first laser resonator to change said temporal overlap between the pulses; and

(d) during step (c) recording the magnitude of the response of said detector at a plurality of different degrees of temporal overlap of the pulses.

2. (Original) The method of claim 1, wherein in step (d) the degree of temporal overlap of the pulses is recorded together with the magnitude of the response at each degree of temporal overlap.

3. (Original) The method of claim 2, wherein said degree of temporal overlap is recorded as one of phase and time.

4. (Original) The method of claim 1, wherein said resonator length is varied continuously.

5. (Original) The method of claim 1, wherein said resonator length is varied incrementally.

6. (Original) The method of claim 1, wherein said detector is a two-photon detector.

7. (Original) The method of claim 1, wherein said first and second pulse repetition frequencies are equal.

8. (Original) A cross-correlation method for laser pulses, comprising:

(a) providing first and second repetitively pulsed laser resonators delivering first and second pulse trains at respectively first and second pulse repetition frequencies;

(b) directing said pulse trains to spatially overlap on a detector, said detector providing a response when a pulse of said first pulse train temporally overlaps a pulse of said second pulse train, said detector response having a magnitude dependent on the degree of temporal overlap of said pulses;

(c) varying the length of said first laser resonator until said first and second pulse repetition frequencies are equal;

(d) following step (c) varying the length of said first laser resonator to change said temporal overlap between the pulses; and

(e) during step (d) recording the magnitude of the response of said detector at a plurality of different degrees of temporal overlap of the pulses.

9. (Original) The method of claim 8, wherein in step (e) the degree of temporal overlap of the pulses is recorded together with the magnitude of the response at each degree of temporal overlap.

10. (Original) The method of claim 9, wherein said degree of temporal overlap is recorded as one of phase and time.

11. (Original) The method of claim 8, wherein in step (c) said laser resonator length is further varied such that said first and second pulse trains have a predetermined phase relationship with each other.

12. (Original) An auto-correlation method for laser pulses, comprising:

(a) providing a repetitively pulsed laser resonator delivering a train of pulses having a pulse repetition frequency, said pulse repetition frequency being selectively variable;

(b) optically dividing each pulse of said pulse train into first and second pulse components;

(c) directing said first and second pulse components along first and second paths onto a detector, said second path being longer than said first path, said detector providing a response when a said first pulse component temporally overlaps a said second pulse component on said detector, said detector response having a magnitude dependent on the degree of temporal overlap of said pulse components and;

(d) varying said pulse-repetition frequency to change said temporal overlap between said pulse components; and

(e) during step (d) recording the magnitude of the response of said detector at a plurality of different degrees of temporal overlap of the pulses.

13. (Original) The method of claim 12, wherein in step (e) the degree of temporal overlap of said pulse components is recorded together with the magnitude of the response at each degree of temporal overlap.

14. (Currently Amended) The method of claim 12, wherein, in step [[(c)]] (d), said pulse-repetition frequency is varied by varying the optical length of said laser resonator.

15. (Currently Amended) An auto-correlation method for laser pulses, comprising:

(a) providing a repetitively pulsed laser resonator delivering a train of pulses having a pulse repetition frequency, said pulse repetition frequency being selectively variable;

(b) optically dividing each pulse of said pulse train into first and second pulse components;

(c) directing said first and second pulse components along first and second paths onto a detector, said second path being longer than said first path, said detector

providing a response when a said first pulse component temporally overlaps a said second pulse component on said detector, said detector response having a magnitude dependent on the degree of temporal overlap of said pulse components and;

(d) varying said pulse-repetition frequency to change said temporal overlap between said pulse components; and

(e) during step (d) recording the magnitude of the response of said detector at a plurality of different degrees of temporal overlap of the pulses,

~~The method of claim 14,~~ wherein said difference between said first and second paths is about equal to twice the optical length of said laser resonator.

16. (Original) The method of claim 14, wherein the second pulse component of an Nth pulse in said pulse train temporally overlaps the first component of the (N+1)th pulse in said pulse train.

17. (Original) The method of claim 12, wherein in step (d) said frequency is varied incrementally.